查询NJG1553BF供应商

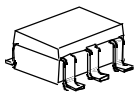
1.9GHz BAND MIXER GaAs MMIC

■GENARAL DESCRIPTION

NJG1553BF is a GaAs MMIC MIXER IC with built-in local amplifier for 1.9GHz PCS applications.

This mixer features high conversion gain, low noise figure and low distortion.

■PACKAGE OUTLINE

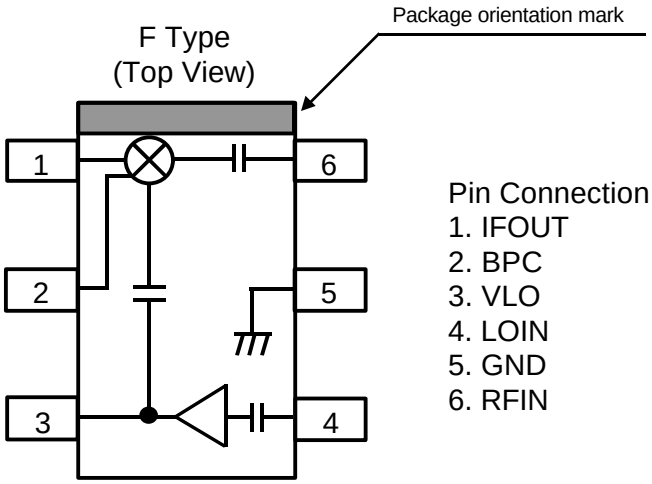


NJG1553BF

■FEATURES

●Low Voltage Operation	+2.7V	
●Low Current Consumption	7.0mA	
●High Conversion Gain	11dB typ.	@f_{RF}=1960MHz, P_{RF}=-30dBm f_{LO}=2090MHz, P_{LO}=-10dBm
●Low noise figure	7dB typ.	@f_{RF}=1960MHz, f_{LO}=2090MHz, P_{LO}=-10dBm
●High Input IP3	-1dBm typ.	@f_{RF1}=1960.0MHz, f_{RF2}=1960.1MHz, P_{RF}=-30dBm f_{LO}=2090MHz, P_{LO}=-10dBm
●Small package	MTP6 (Mount Size: 2.8x2.9x1.2mm)	

■PIN CONFIGURATION



Pin Connection
1. IFOUT
2. BPC
3. VLO
4. LOIN
5. GND
6. RFIN

NOTE: Please note that any information on this catalog will be subject to change.

■ABSOLUTE MAXIMUM RATINGS

(T_a=25°C, Z_s=Z_l=50Ω)

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNITS
Mixer Supply Voltage	V_{MIX}		6.5	V
Local amp. Supply Voltage	V_{LO}		6.5	V
Mixer RF Input Power	P_{RFIN}	V_{MIX}=V_{LO}=2.7V	10	dBm
Mixer LO Input Power	P_{LOIN}	V_{MIX}=V_{LO}=2.7V	10	dBm
Power Dissipation	P_D		150	mW
Operating Temperature	T_{opr}		-30~+85	°C
Storage Temperature	T_{stg}		-40~+150	°C

■RECOMMENDED OPERATING RANGE

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Supply Voltage Mixer	V_{MIX}		2.5	2.7	5.8	V
Supply Voltage Local Amp.	V_{LO}		2.5	2.7	5.8	V

■ELECTRICAL CHARACTERISTICS (DC CHARACTERISTICS)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Mixer Current	I_{MIX}	P_{RF}=OFF, P_{LO}=OFF	-	5.0	7.0	mA
Local Amp. Current	I_{LO}	P_{RF}=OFF, P_{LO}=OFF	-	2.0	3.2	mA

■ELECTRICAL CHARACTERISTICS (AC CHARACTERISTICS)

(V_{MIX}=V_{LO}=2.7V, f_{RF}=1960MHz, f_{LO}=2090MHz, f_{IF}=130MHz, P_{RF}=-30dBm, P_{LO}=-10dBm, T_a=25ºC,
Z_s=Z_l=50Ω, Measuring Test Circuit)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Operating RF Frequency	freq		1930	1960	1990	MHz
Conversion Gain	G_C		9	11	-	dB
Input 3rd Order Intercept Point	IIP3	f_{RF}=1960.0+1960.1MHz	-	-1	-	dBm
Noise Figure	NF		-	7.0	8.5	dB

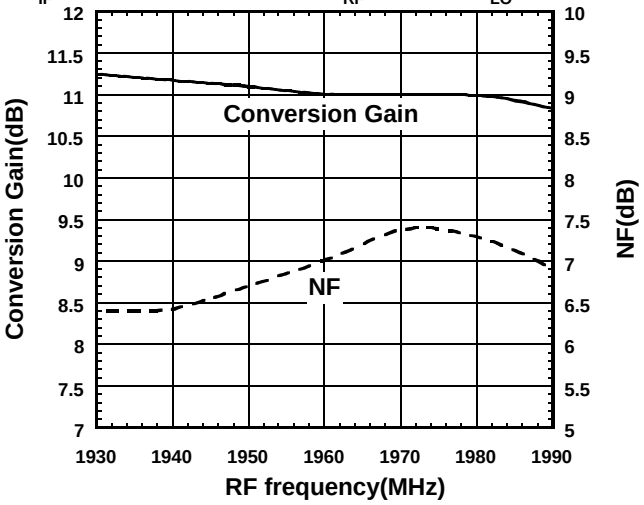
■TERMINAL EXPLANATION

PIN No.	SYMBOL	DESCRIPTIONS
1	IFOUT	IF signal output terminal of mixer. External matching circuit is required. Please connect mixer power supply through inductor (L6, L7) as shown in test circuit. Please place bypass capacitors (C6, C7, C8) close to C2.
2	BPC	Bypass capacitor terminal of mixer.
3	VLO	Local amplifier power supply terminal. Please place R1 and L5 close to this terminal as shown in test circuit, and place bypass capacitors (C3, C4) close to R1 and L5.
4	LOIN	Local power input terminal of local amplifier. External matching circuit is required.
5	GND	Ground terminal (0V). Please place grounding VIAs as close as possible.
6	RFIN	RF signal input terminal of mixer. External matching circuit is required.

■TYPICAL CHARACTERISTICS

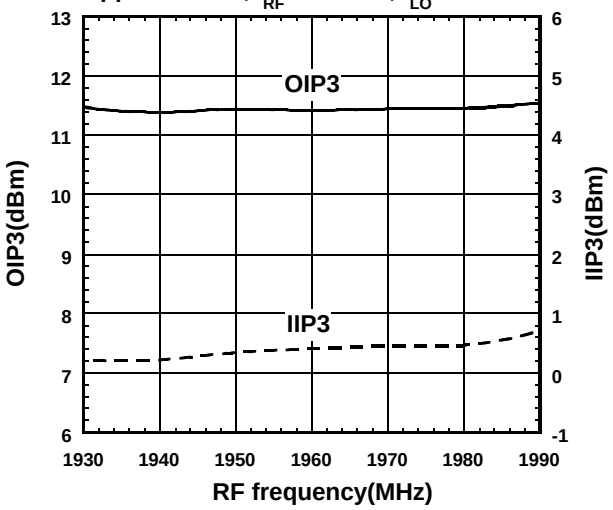
Conversion Gain,NF vs. RF frequency

$V_{MIX}=V_{LO}=2.7V, I_{MIX}=5.0mA, I_{LO}=1.9mA,$
$f_{IF}=130MHz$, Upper LOCAL, $P_{RF}=-30dBm, P_{LO}=-10dBm$



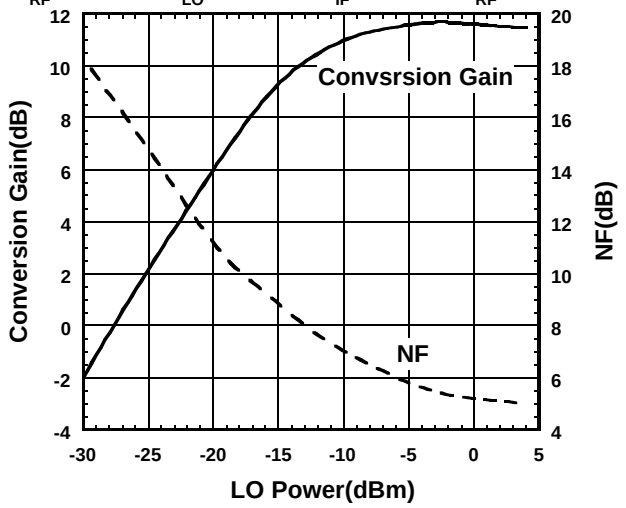
OIP3,IIP3 vs. RF frequency

$V_{MIX}=V_{LO}=2.7V, I_{MIX}=5.0mA, I_{LO}=1.9mA,$
Upper LOCAL, $P_{RF}=-30dBm, P_{LO}=-10dBm$



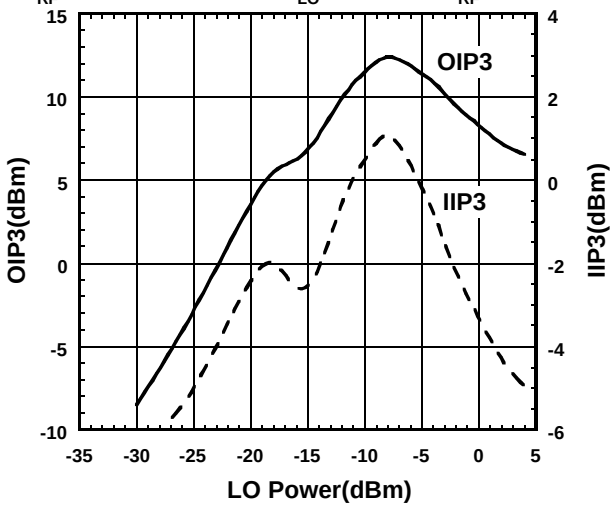
Conversion Gain,NF vs. LO Power

$V_{MIX}=V_{LO}=2.7V, I_{MIX}=5.0mA, I_{LO}=1.9mA,$
$f_{RF}=1960MHz, f_{LO}=2090MHz, f_{IF}=130MHz, P_{RF}=-30dBm$



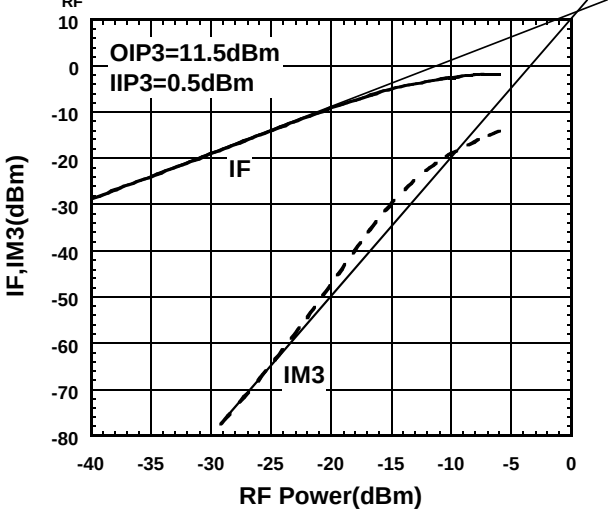
OIP3,IIP3 vs. LO Power

$V_{MIX}=V_{LO}=2.7V, I_{MIX}=5.0mA, I_{LO}=1.9mA,$
$f_{RF}=1960.0+1960.1MHz, f_{LO}=2090MHz, P_{RF}=-30dBm$

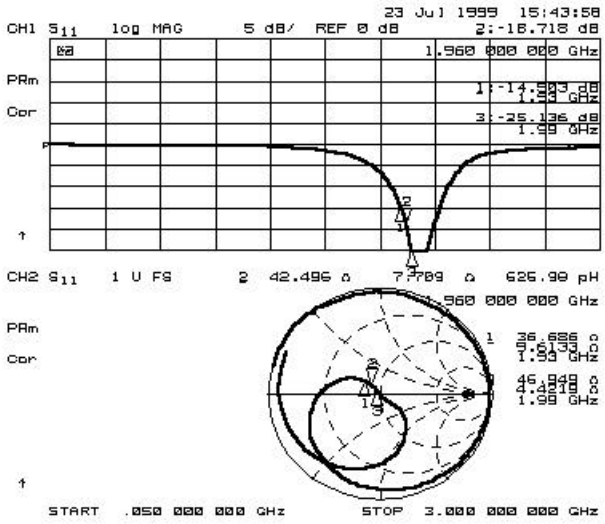


IF,IM3 vs. RF Power

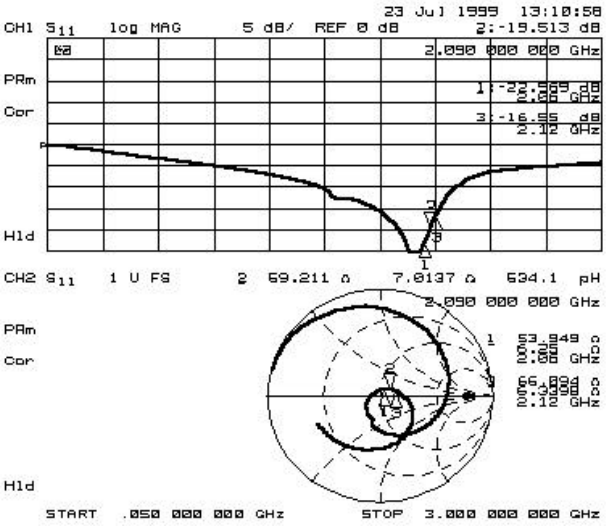
$V_{MIX}=V_{LO}=2.7V, I_{MIX}=5.0mA, I_{LO}=1.9mA,$
$f_{RF}=1960.0+1960.1MHz$, fO=2090MHz, PO=-10dBm



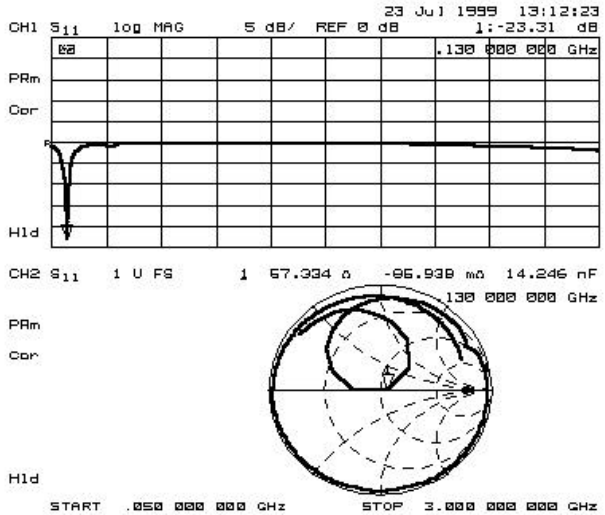
■TYPICAL CHARACTERISTICS



RFIN port Impedance



LOIN port Impedance



IFOUT port Impedance

■APPLICATION CIRCUIT

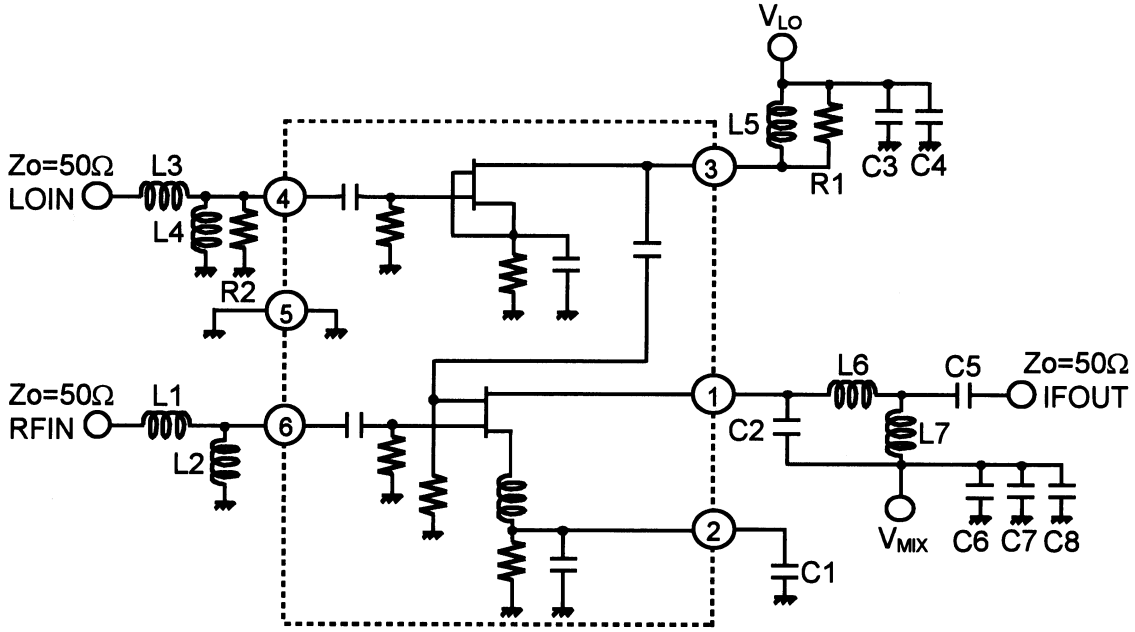
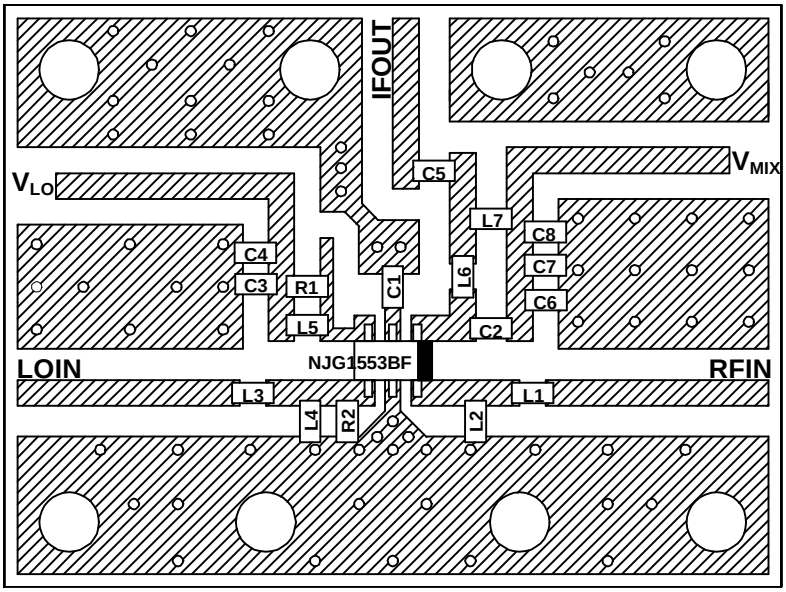


Table: The parts used in the circuit above

PART ID	PCS BAND Upper LOCAL f_{LO}=2090MHz f_{IF}=130MHz	Remarks
L1	8.2nH	TAIYO-YUDEN(HK1608)
L2	8.2nH	TAIYO-YUDEN(HK1608)
L3	3.9nH	TAIYO-YUDEN(HK1608)
L4	10nH	TAIYO-YUDEN(HK1608)
L5	4.7nH	TAIYO-YUDEN(HK1608)
L6	100nH	TAIYO-YUDEN(HK1608)
L7	56nH	TAIYO-YUDEN(HK1608)
C1	1000pF	MURATA(GRM39)
C2	10pF	MURATA(GRM39)
C3	10pF	MURATA(GRM39)
C4	100pF	MURATA(GRM39)
C5	1000pF	MURATA(GRM39)
C6	10pF	MURATA(GRM39)
C7	100pF	MURATA(GRM39)
C8	1000pF	MURATA(GRM39)
R1	180Ω	1608 Size
R2	82Ω	1608 Size

■RECOMMENDED PCB DESIGN

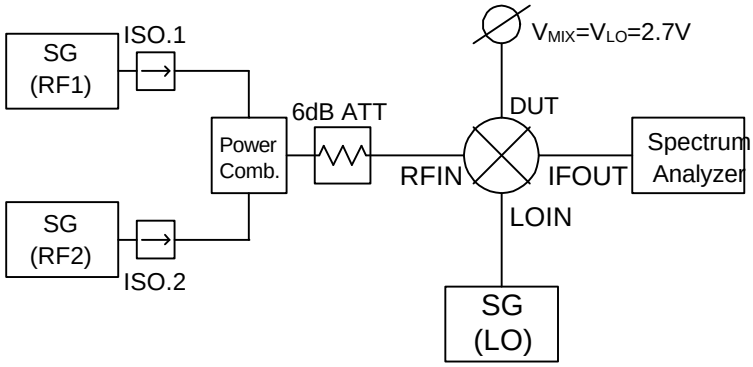


PCB: FR-4 t=0.5mm
Microstrip Line Width=1mm
PCB Size: 22.5x30.0mm

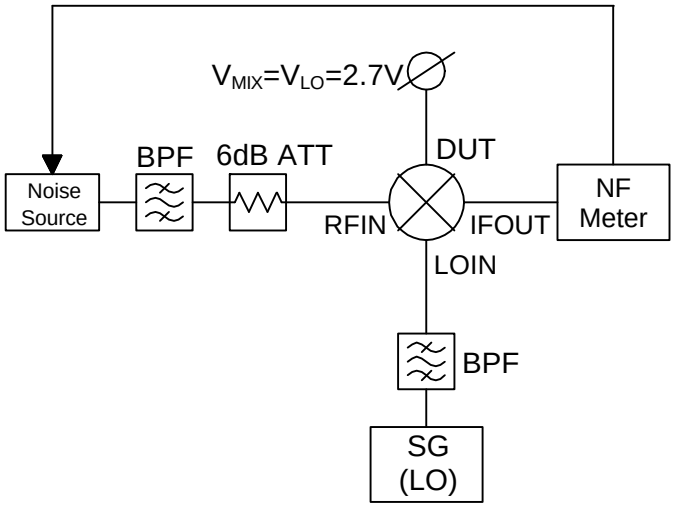
PRECAUTIONS

[1] Please place a inductor L1 at about 3.5mm distance from RFIN terminal (Pin #6).
[2] Please place a inductor L3 at about 3.5mm distance from LOIN terminal (Pin #4).
[3] Please place a capacitor C1 close to by-pass capacitor terminal (Pin #2).
[4] Please place capacitors C6, C7, C8 close to C2.
[5] Please place capacitors C3, C4 close to R1 and L5.

■MEASURING BLOCK DIAGRAM

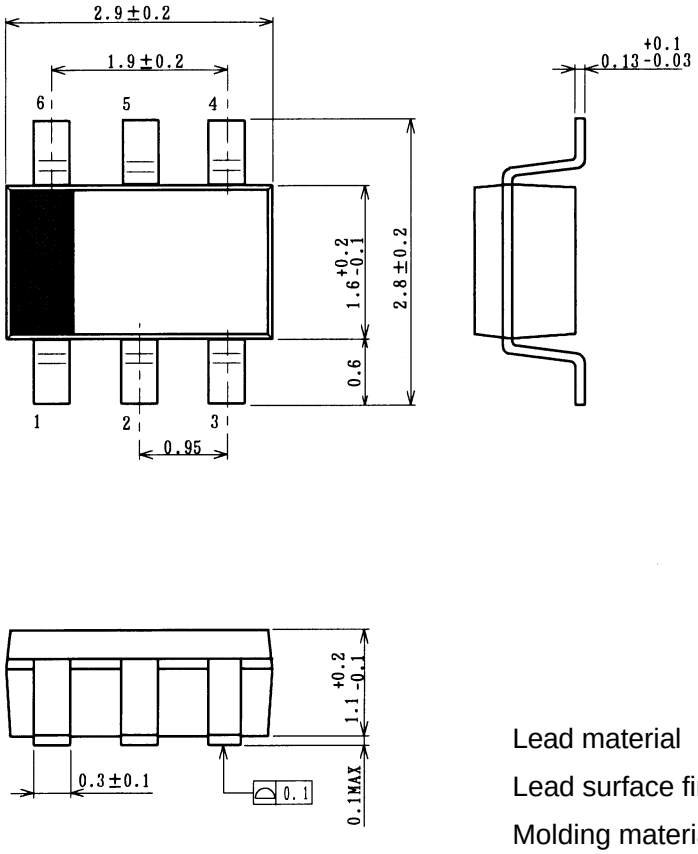


IF, IM3 Measuring Block Diagram



Noise Figure Measuring Block Diagram

■PACKAGE OUTLINE (MTP6)



Lead material	: Copper
Lead surface finish	: Solder plating
Molding material	: Epoxy resin
Unit	: mm
Weight	: 14mg

Cautions on using this product

This product contains Gallium-Arsenide (GaAs) which is a harmful material.

- Do NOT eat or put into mouth.
- Do NOT dispose in fire or break up this product.
- Do NOT chemically make gas or powder with this product.
- To waste this product, please obey the relating law of your country.

This product may be damaged with electric static discharge (ESD) or spike voltage. Please handle with care to avoid these damages.

[CAUTION]
The specifications on this databook are only given for information , without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.